

behind the counter in a place where the temperature is even. When a customer calls for a cigar the dealer takes the box out of the chest, serves his customer, and then puts the box back again. The box being opened for a moment the cigars are not perceptibly affected. The cigars in the close, heavy chest are always safe from atmospheric influences, as the boxes are closed, and the chest is open but a moment, while the dealer is taking out a box from which to serve his customer.

Some of the best dealers have either a large chest or a cool vault in which they keep their stock, taking out from time to time whatever they need for use. Some have a number of small chests, in which they keep different brands, so as to avoid opening and closing one particular chest so often.

It may be said that it is only the higher priced cigars that need special care in handling, although the cheaper grades are not to be handled carelessly. The Havana cigars are more susceptible to change, for there is a delicacy of flavor to be preserved that is never present in the cheaper grades of cigars.

Every dealer must, of course, make a display in his show case, but he need not serve his patrons with these cigars. The shrinkage in value of the cigars in the case is merely a business proposition of profit and loss.

Cigar Flavoring.—I.—Macerate 2 ounces of cinnamon and 4 ounces of tonka beans, ground fine, in 1 quart of rum.

II.—Moisten ordinary cigars with a strong tincture of cascarilla, to which a little gum benzoin and storax may be added. Some persons add a small quantity of camphor or oil of cloves or cassia.

III.—Tincture of valerian. 4 drachms
Butyric aldehyde... 4 drachms
Nitrous ether..... 1 drachm
Tincture vanilla.... 2 drachms
Alcohol..... 5 ounces
Water enough to make..... 16 ounces

IV.—Extract vanilla..... 4 ounces
Alcohol..... $\frac{1}{2}$ gallon
Jamaica rum..... $\frac{1}{2}$ gallon
Tincture valerian... 8 ounces
Caraway seed..... 2 ounces
English valerian root 2 ounces
Bitter orange peel... 2 ounces
Tonka beans..... 4 drachms
Myrrh..... 16 ounces

Soak the myrrh for 3 days in 6 quarts of water, add the alcohol, tincture valerian, and extract of vanilla, and after

grinding the other ingredients to a coarse powder, put all together in a jug and macerate for 2 weeks, occasionally shaking; lastly, strain.

V.—Into a bottle filled with $\frac{1}{2}$ pint of French brandy put $1\frac{1}{2}$ ounces of cascarilla bark and $1\frac{1}{2}$ ounces of vanilla previously ground with $\frac{1}{2}$ pound of sugar; carefully close up the flask and distil in a warm place. After 3 days pour off the liquid, and add $\frac{1}{4}$ pint of mastic extract. The finished cigars are moistened with this liquid, packed in boxes, and preserved from air by a well-closed lid. They are said to acquire a pleasant flavor and mild strength through this treatment.

Cigar Spots.—The speckled appearance of certain wrappers is due to the work of a species of fungus that attacks the growing tobacco. In a certain district of Sumatra, which produces an exceptionally fine tobacco for wrappers, the leaves of the plant are commonly speckled in this way. Several patents have been obtained for methods of spotting tobacco leaves artificially. A St. Louis firm uses a solution composed of:

Sodium carbonate..... 3 parts
Calx chlorinata..... 1 part
Hot water..... 8 parts

Dissolve the washing soda in the hot water, add the chlorinated lime, and heat the mixture to a boiling temperature for 3 minutes. When cool, decant into earthenware or stoneware jugs, cork tightly, and keep in a cool place. The corks of jugs not intended for immediate use should be covered with a piece of bladder or strong parchment paper, and tightly tied down to prevent the escape of gas, and consequent weakening of the bleaching power of the fluid. The prepared liquor is sprinkled on the tobacco, the latter being then exposed to light and air, when, it is said, the disagreeable odor produced soon disappears.

CINCHONA:

See Wines and Liquors.

CINNAMON ESSENCE:

See Essences and Extracts.

CINNAMON OIL AS AN ANTISEPTIC:

See Antiseptics.

CITRATE OF MAGNESIUM:

See Magnesium Citrate.

CLARET LEMONADE AND CLARET PUNCH:

See Beverages, under Lemonades.

CLARIFICATION OF GELATIN AND GLUE:

See Gelatin.

CLARIFYING.

Clarification is the process by which any solid particles suspended in a liquid are either caused to coalesce together or to adhere to the medium used for clarifying, that they may be removed by filtration (which would previously have been impossible), so as to render the liquid clear.

One of the best agents for this purpose is albumen. When clarifying vegetable extracts, the albumen which is naturally present in most plants accomplishes this purpose easily, provided the vegetable matter is extracted in the cold, so as to get as much albumen as possible in solution.

Egg albumen may also be used. The effect of albumen may be increased by the addition of cellulose, in the form of a fine magma of filtering paper. This has the further advantage that the subsequent filtration is much facilitated.

Suspended particles of gum or pectin may be removed by cautious precipitation with tannin, of which only an exceedingly small amount is usually necessary. It combines with the gelatinous substances better with the aid of heat than in the cold. There must be no excess of tannin used.

Another method of clarifying liquids turbid from particles of gum, albumen, pectin, etc., is to add to them a definite quantity of alcohol. This causes the former substances to separate in more or less large flakes. The quantity of alcohol required varies greatly according to the nature of the liquid. It should be determined in each case by an experiment on a small scale.

Resinous or waxy substances, such as are occasionally met with in honey, etc., may be removed by the addition of bole, pulped filtering paper, and heating to boiling.

In each case the clarifying process may be hastened by making the separating particles specifically heavier; that is, by incorporating some heavier substance, such as talcum, etc., which may cause the flocculi to sink more rapidly, and to form a compact sediment.

Clarifying powder for alcoholic liquids:

| | |
|----------------------|----------|
| Egg albumen, dry.... | 40 parts |
| Sugar of milk..... | 40 parts |
| Starch..... | 20 parts |

Reduce them to very fine powder, and mix thoroughly.

For clarifying liquors, wines, essences, etc., take for every quart of liquid 75 grains of the above mixture, shake repeatedly in the course of a few days, the mixture being kept in a warm room, then filter.

Powdered talcum renders the same service, and has the additional advantage of being entirely insoluble. However, the above mixture acts more energetically.

CLAY:

Claying Mixture for Forges.—Twenty parts fire clay; 20 parts cast-iron turnings; 1 part common salt; $\frac{1}{2}$ part sal ammoniac; all by measure.

The materials should be thoroughly mixed dry and then wet down to the consistency of common mortar, constantly stirring the mass as the wetting proceeds. A rough mold shaped to fit the tuyère opening, a trowel, and a few minutes' time are all that are needed to complete the successful claying of the forge. This mixture dries hard and when glazed by the fire will last.

Plastic Modeling Clay.—A permanently plastic clay can be obtained by first mixing it with glycerine, turpentine, or similar bodies, and then adding vaseline or petroleum residues rich in vaseline. The proportion of clay to the vaseline varies according to the desired consistency of the product, the admixture of vaseline varying from 10 to 50 per cent. It is obvious that the hardness of the material decreases with the amount of vaseline added, so that the one richest in vaseline will be the softest. By the use of various varieties of clay and the suitable choice of admixtures, the plasticity, as well as the color of the mass, may be varied.

Cleaning Preparations and Methods

(See also Soaps, Polishes, and Household Formulas).

TO REMOVE STAINS FROM THE HANDS:

Removal of Aniline-Dye Stains from the Skin.—Rub the stained skin with a pinch of slightly moistened red crystals of chromic trioxide until a distinct sensation of warmth announces the destruction of the dye stuff by oxidation and an incipient irritation of the skin. Then rinse with soap and water. A single application usually suffices to remove

the stain. It is hardly necessary to call attention to the poisonousness and strong caustic action of chromic trioxide; but only moderate caution is required to avoid evil effects.

Pyrogallic-Acid Stains on the Fingers (see also Photography).—Pyro stains may be prevented fairly well by rubbing in a little wool fat before beginning work. A very effective way of eliminating developer stains is to dip the finger tips occasionally during development into the clearing bath. It is best to use the clearing bath, with ample friction, before resorting to soap, as the latter seems to have a fixing effect upon the stain. Lemon peel is useful for removing pyro stains, and so are the ammonium persulphate reducer and the thiocarbamide clearer.

To Clean Very Soiled Hands.—In the morning wash in warm water, using a stiff brush, and apply glycerine. Repeat the application two or three times during the day, washing and brushing an hour or so afterwards, or apply a warm solution of soda or potash, and wash in warm water, using a stiff brush as before. Finally, rub the hands with pumice or infusorial earth. There are soaps made especially for this purpose, similar to those for use on woodwork, etc., in which infusorial earth or similar matter is incorporated.

To Remove Nitric-Acid Stains.—One plan to avoid stains is to use rubber finger stalls, or rubber gloves. Nitric-acid stains can be removed from the hands by painting the stains with a solution of permanganate of potash, and washing off the permanganate with a 5 per cent solution of hydrochloric (muriatic) acid. After this wash the hands with pure castile soap. Any soap that roughens the skin should be avoided at all times. Castile soap is the best to keep the skin in good condition.

CLEANING GILDED ARTICLES:

To Clean Gilt Frames and Gilded Surfaces Generally.—Dip a soft brush in alcohol to which a few drops of ammonia water has been added, and with it go over the surface. Do not rub—at least, not roughly, or harshly. In the course of five minutes the dirt will have become soft, and easy of removal. Then go over the surface again gently with the same or a similar brush dipped in rain water. Now lay the damp article in the sunlight to dry. If there is no sunlight, place it near a warm (but not hot) stove, and let dry completely. In order to avoid

streaks, take care that the position of the article, during the drying, is not exactly vertical.

To Clean Fire-Gilt Articles.—Fire-gilt articles are cleaned, according to their condition, with water, diluted hydrochloric acid, ammonia, or potash solution. If hydrochloric acid is employed thorough dilution with water is especially necessary. The acidity should hardly be noticeable on the tongue.

To clean gilt articles, such as gold moldings, etc., when they have become tarnished or covered with flyspecks, etc., rub them slowly with an onion cut in half and dipped in rectified alcohol, and wash off lightly with a moist soft sponge after about 2 hours.

Cleaning Gilded and Polychromed Work on Altars.—To clean bright gold a fine little sponge is used which is moistened but lightly with tartaric acid and passed over the gilding. Next go over the gilt work with a small sponge saturated with alcohol to remove all dirt. For matt gilding, use only a white flannel dipped in lye, and carefully wipe off the dead gold with this, drying next with a fine linen rag. To clean polychromed work sponge with a lye of rain water, 1,000 parts, and calcined potash, 68 parts, and immediately wash off with a clean sponge and water, so that the lye does not attack the paint too much.

SPOT AND STAIN REMOVERS:

To Remove Aniline Stains.—

- I.—Sodium nitrate..... 7 grains
Diluted sulphuric acid 15 grains
Water..... 1 ounce

Let the mixture stand a day or two before using. Apply to the spot with a sponge, and rinse the goods with plenty of water.

II.—An excellent medium for the removal of aniline stains, which are often very stubborn, has been found to be liquid opodeldoc. After its use the stains are said to disappear at once and entirely.

Cleansing Fluids.—A spot remover is made as follows:

- I.—Saponine..... 7 parts
Water..... 130 parts
Alcohol..... 70 parts
Benzine..... 1,788 parts
Oil mirbane..... 5 parts
II.—Benzene (benzol).. 89 parts
Ascectic ether..... 10 parts
Pear oil..... 1 part

This yields an effective grease eradiator, of an agreeable odor.

III.—To Remove Stains of Sulphate of copper, or of salts of mercury, silver, or gold from the hands, etc., wash them first with a dilute solution either of ammonia, iodide, bromide, or cyanide of potassium, and then with plenty of water; if the stains are old ones they should first be rubbed with the strongest acetic acid and then treated as above.

Removal of Picric-Acid Stains.—I.—Recent stains of picric acid may be removed readily if the stain is covered with a layer of magnesium carbonate, the carbonate moistened with a little water to form a paste, and the paste then rubbed over the spot.

II.—Apply a solution of

| | |
|---------------------|-----------|
| Boric acid..... | 4 parts |
| Sodium benzoate.... | 1 part |
| Water..... | 100 parts |

III.—Dr. Prieur, of Besançon, recommends lithium carbonate for the removal of picric-acid stains from the skin or from linen. The method of using it is simply to lay a small pinch on the stain, and moisten the latter with water. Fresh stains disappear almost instantly, and old ones in a minute or two.

To Remove Finger Marks from Books, etc.—I.—Pour benzol (not benzine or gasoline, but Merck's "c. p." crystallizable) on calcined magnesia until it becomes a crumbling mass, and apply this to the spot, rubbing it in lightly, with the tip of the finger. When the benzol evaporates, brush off. Any dirt that remains can be removed by using a piece of soft rubber.

II.—If the foregoing fails (which it sometimes, though rarely, does), try the following: Make a hot solution of sodium hydrate in distilled water, of strength of from 3 per cent to 5 per cent, according to the age, etc., of the stain. Have prepared some bits of heavy blotting paper somewhat larger than the spot to be removed; also, a blotting pad, or several pieces of heavy blotting paper. Lay the soiled page face downward on the blotting pad, then, saturating one of the bits of blotter with the hot sodium hydrate solution, put it on the stain and go over it with a hot smoothing iron. If one application does not remove all the grease or stain, repeat the operation. Then saturate another bit of blotting paper with a 4 per cent or 5 per cent solution of hydrochloric acid in distilled water, apply it to the place, and pass the iron over it to neutralize the strong alkali. This process will instantly restore any faded writing or printing, and make the paper bright and fresh again.

Glycerine as a Detergent.—For certain kinds of obstinate spots (such as coffee and chocolate, for instance) there is no better detergent than glycerine, especially for fabrics with delicate colors. Apply the glycerine to the spot, with a sponge or otherwise, let stand a minute or so, then wash off with water or alcohol. Hot glycerine is even more efficient than cold.

CLEANING SKINS AND LEATHER:

See also Leather.

To Clean Colored Leather.—Pour carbon bisulphide on non-vulcanized gutta-percha, and allow it to stand about 24 hours. After shaking actively add more gutta-percha gradually until the solution becomes of gelatinous consistency. This mixture is applied in suitable quantity to oil-stained, colored leather and allowed to dry two or three hours. The subsequent operation consists merely in removing the coat of gutta-percha from the surface of the leather—that is, rubbing it with the fingers, and rolling it off the surface.

The color is not injured in the least by the sulphuret of carbon; only those leathers on which a dressing containing starch has been used look a little lighter in color, but the better class of leathers are not so dressed. The dry gutta-percha can be redissolved in sulphuret of carbon and used over again.

To Clean Skins Used for Polishing Purposes.—First beat them thoroughly to get rid of dust, then go over the surface on both sides with a piece of good white soap and lay them in warm water in which has been put a little soda. Let them lie here for 2 hours, then wash them in plenty of tepid water, rubbing them vigorously until perfectly clean. This bath should also be made alkaline with soda. The skins are finally rinsed in warm water, and dried quickly. Cold water must be avoided at all stages of the cleansing process, as it has a tendency to shrink and harden the skins.

The best way to clean a chamois skin is to wash and rinse it out in clean water immediately after use, but this practice is apt to be neglected so that the skin becomes saturated with dirt and grime. To clean it, first thoroughly soak in clean, soft water. Then, after soaping it and rolling it into a compact wad, beat it with a small round stick—a buggy spoke, say—turning the wad over repeatedly, and keeping it well wet and soaped. This should suffice to loosen the dirt. Then rinse in clean water until the skin

is clean. As wringing by hand is apt to injure the chamois skin, it is advisable to use a small clothes wringer. Before using the skin again rinse it in clear water to which a little pulverized alum has been added.

STRAW-HAT RENOVATION:

To Renovate Straw Hats.—I.—Hats made of natural (uncolored) straw, which have become soiled by wear, may be cleaned by thoroughly sponging with a weak solution of tartaric acid in water, followed by water alone. The hat after being so treated should be fastened by the rim to a board by means of pins, so that it will keep its shape in drying.

II.—Sponge the straw with a solution of

| | By weight |
|--------------------------|-----------|
| Sodium hyposulphite..... | 10 parts |
| Glycerine..... | 5 parts |
| Alcohol..... | 10 parts |
| Water..... | 75 parts |

Lay aside in a damp place for 24 hours and then apply

| | By weight |
|------------------|-----------|
| Citric acid..... | 2 parts |
| Alcohol..... | 10 parts |
| Water..... | 90 parts |

Press with a moderately hot iron, after stiffening with weak gum water, if necessary.

III.—If the hat has become much darkened in tint by wear the fumes of burning sulphur may be employed. The material should be first cleaned by thoroughly sponging with an aqueous solution of potassium carbonate, followed by a similar application of water, and it is then suspended over the sulphur fumes. These are generated by placing in a metal or earthen dish, so mounted as to keep the heat from setting fire to anything beneath, some brimstone (roll sulphur), and sprinkling over it some live coals to start combustion. The operation is conducted in a deep box or barrel, the dish of burning sulphur being placed at the bottom, and the article to be bleached being suspended from a string stretched across the top. A cover not fitting so tightly as to exclude all air is placed over it, and the apparatus allowed to stand for a few hours.

Hats so treated will require to be stiffened by the application of a little gum water, and pressed on a block with a hot iron to bring them back into shape.

Waterproof Stiffening for Straw Hats.

—If a waterproof stiffening is required use one of the varnishes for which formulas follow:

| | |
|------------------------|-----------|
| I.—Copal..... | 450 parts |
| Sandarac..... | 75 parts |
| Venice turpentine..... | 40 parts |
| Castor oil..... | 5 parts |
| Alcohol..... | 800 parts |

| | |
|------------------------|-------------|
| II.—Shellac..... | 500 parts |
| Sandarac..... | 175 parts |
| Venice turpentine..... | 50 parts |
| Castor oil..... | 15 parts |
| Alcohol..... | 2,000 parts |

| | |
|------------------------|-------------|
| III.—Shellac..... | 750 parts |
| Rosin..... | 150 parts |
| Venice turpentine..... | 150 parts |
| Castor oil..... | 20 parts |
| Alcohol..... | 2,500 parts |

How to Clean a Panama Hat.—Scrub with castile soap and warm water, a nail brush being used as an aid to get the dirt away. The hat is then placed in the hot sun to dry and in the course of two or three hours is ready for use. It will not only be as clean as when new, but it will retain its shape admirably. The cleaned hat will be a trifle stiff at first, but will soon grow supple under wear.

A little glycerine added to the rinsing water entirely prevents the stiffness and brittleness acquired by some hats in drying, while a little ammonia in the washing water materially assists in the scrubbing process. Ivory, or, in fact, any good white soap, will answer as well as castile for the purpose. It is well to rinse a second time, adding the glycerine to the water used the second time. Immerse the hat completely in the rinse water, moving it about to get rid of traces of the dirty water. When the hat has been thoroughly rinsed, press out the surplus water, using a Turkish bath towel for the purpose, and let it rest on the towel when drying.

PAINT, VARNISH, AND ENAMEL REMOVERS:

To Remove Old Oil, Paint, or Varnish Coats.—I.—Apply a mixture of 1 part 28 per cent ammonia water, 36 parts sand, 63 parts of 40 per cent soda lye. The composition dissolves the old varnish coat, as well as the paint, down to the bottom. The varnish coatings which are to be removed may be brushed off or left for days in a hardened state. Upon being thoroughly moistened with water the old varnish may be readily washed off, the lacquer as well as the oil paint coming off completely. The ammonia otherwise employed dissolves the varnish, but not the paint.

II.—Apply a mixture of 1 part oil of turpentine and 2 parts of ammonia. This is effective, even if the coatings withstand the strongest lye. The two liquids are shaken in a bottle until they mix like milk. The mixture is applied to the coating with a little oakum; after a few minutes the old paint can be wiped off.

To Clean Brushes and Vessels of Dry Paint (see also *Brushes and Paints*).—The cleaning of the brushes and vessels in which the varnish or oil paint had dried is usually done by boiling with soda solution. This frequently spoils the brushes or cracks the vessels if of glass; besides, the process is rather slow and dirty. A much more suitable remedy is amyl acetate, which is a liquid with a pleasant odor of fruit drops, used mainly for dissolving and cementing celluloid. If amyl acetate is poured over a paint brush the varnish or hardened paint dissolves almost immediately and the brush is again rendered serviceable at once. If necessary, the process is repeated. For cleaning vessels shake the liquid about in them, which softens the paint so that it can be readily removed with paper. In this manner much labor can be saved. The amyl acetate can be easily removed from the brushes, etc., by alcohol or oil of turpentine.

Varnish and Paint Remover.—Dissolve 20 parts of caustic soda (98 per cent) in 100 parts of water, mix the solution with 20 parts of mineral oil, and stir in a kettle provided with a mechanical stirrer, until the emulsion is complete. Now add, with stirring, 20 parts of sawdust and pass the whole through a paint mill to obtain a uniform intermixture. Apply the paste moist.

To Remove Varnish from Metal.—To remove old varnish from metals, it suffices to dip the articles in equal parts of ammonia and alcohol (95 per cent).

To Remove Water Stains from Varnished Furniture.—Pour olive oil into a dish and scrape a little white wax into it. This mixture should be heated until the wax melts and rubbed sparingly on the stains. Finally, rub the surface with a linen rag until it is restored to brilliancy.

To Remove Paint, Varnish, etc., from Wood.—Varnish, paint, etc., no matter how old and hard, may be softened in a few minutes so that they can be easily scraped off, by applying the following mixture:

| | |
|-------------------------------------|---------|
| Water glass..... | 5 parts |
| Soda lye, 40° B. (27 per cent)..... | 1 part |
| Ammonia water..... | 1 part |

Mix.

Removing Varnish, etc.—A patent has been taken out in England for a liquid for removing varnish, lacquer, tar, and paint. The composition is made by mixing 4 ounces of benzol, 3 ounces of fusel oil, and 1 ounce of alcohol. It is stated by the inventor that this mixture, if applied to a painted or varnished surface, will make the surface quite clean in less than 10 minutes, and that a paint-soaked brush "as hard as iron" can be made as soft and pliable as new by simply soaking for an hour or so in the mixture.

To Remove Enamel and Tin Solder.—Pour enough of oil of vitriol (concentrated sulphuric acid) over powdered fluorspar in an earthen or lead vessel, so as just to cover the parts whereby hydrofluoric acid is generated. For use, dip the article suspended on a wire into the liquid until the enamel or the tin is eaten away or dissolved, which does not injure the articles in any way. If heated, the liquid acts more rapidly. The work should always be conducted in the open air, and care should be taken not to inhale the fumes, which are highly injurious to the health, and not to get any liquid on the skin, as hydrofluoric acid is one of the most dangerous poisons. Hydrofluoric acid must be kept in earthen or leaden vessels, as it destroys glass.

Removing Paint and Varnish from Wood.—The following compound is given as one which will clean paint or varnish from wood or stone without injuring the material:

| | |
|----------------------|-----------|
| Flour or wood pulp.. | 385 parts |
| Hydrochloric acid... | 450 parts |
| Bleaching powder... | 160 parts |
| Turpentine..... | 5 parts |

This mixture is applied to the surface and left on for some time. It is then brushed off, and brings the paint away with it. It keeps moist quite long enough to be easily removed after it has acted.

Paste for Removing Old Paint or Varnish Coats.—

| | |
|------------------------|----------|
| I.—Sodium hydrate.... | 5 parts |
| Soluble soda glass... | 3 parts |
| Flour paste..... | 6 parts |
| Water..... | 4 parts |
| II.—Soap..... | 10 parts |
| Potassium hydrate... | 7 parts |
| Potassium silicate.... | 2 parts |

To Remove Old Enamel.—Lay the articles horizontally in a vessel containing a concentrated solution of alum and boil them. The solution should be just sufficient to cover the pieces. In 20 or 25 minutes the old enamel will fall into dust, and the article can be polished with emery. If narrow and deep vessels are used the operation will require more time.

INK ERADICATORS:

Two-Solution Ink Remover.—

- I.—(a) Citric acid 1 part
 Concentrated solution of borax ... 2 parts
 Distilled water.... 16 parts

Dissolve the acid in the water, add the borax solution, and mix by agitation.

- (b) Chloride of lime... 3 parts
 Water..... 16 parts
 Concentrated borax solution 2 parts

Add the chloride of lime to the water, shake well and set aside for a week, then decant the clear liquid and to it add the borax solution.

For use, saturate the spot with solution (a), apply a blotter to take off the excess of liquid, then apply solution (b). When the stain has disappeared, apply the blotter and wet the spot with clean water; finally dry between two sheets of blotting paper.

II.—(a) Mix, in equal parts, potassium chloride, potassium hypochlorite, and oil of peppermint. (b) Sodium chloride, hydrochloric acid and water, in equal parts.

Wet the spot with (a), let dry, then brush it over lightly with (b), and rinse in clear water.

A good single mixture which will answer for most inks is made by mixing citric acid and alum in equal parts. If desired to vend in a liquid form add an equal part of water. In use, the powder is spread well over the spot and (if on cloth or woven fabrics) well rubbed in with the fingers. A few drops of water are then added, and also rubbed in. A final rinsing with water completes the process.

Ink Erasers.—I.—Inks made with nut-galls and copperas can be removed by using a moderately concentrated solution of oxalic acid, followed by use of pure water and frequent drying with clean blotting paper. Most other black inks are erased by use of a weak solution of chlorinated lime, followed by dilute acetic acid and water, with frequent dry-

ing with blotters. Malachite green ink is bleached by ammonia water; silver inks by potassium cyanide or sodium hyposulphite. Some aniline colors are easily removed by alcohol, and nearly all by chlorinated lime, followed by diluted acetic acid or vinegar. In all cases apply the substances with camel's-hair brushes or feathers, and allow them to remain no longer than necessary, after which rinse well with water and dry with blotting paper.

- II.—Citric acid..... 1 part
 Water, distilled..... 10 parts
 Concentrated solution of borax..... 2 parts

Dissolve the citric acid in the water and add the borax. Apply to the paper with a delicate camel's-hair pencil, removing any excess of water with a blotter. A mixture of oxalic, citric, and tartaric acids, in equal parts, dissolved in just enough water to give a clean solution, acts energetically on most inks.

Erasing Powder or Pounce.—Alum, 1 part; amber, 1 part; sulphur, 1 part; saltpeter, 1 part. Mix well together and keep in a glass bottle. If a little of this powder is placed on an ink spot or fresh writing, rubbing very lightly with a clean linen rag, the spot or the writing will disappear at once.

Removing Ink Stains.—I.—The material requiring treatment should first be soaked in clean, warm water, the superfluous moisture removed, and the fabric spread over a clean cloth. Now allow a few minims of liquor ammoniæ fortis, specific gravity 0.891, to drop on the ink spot, then saturate a tiny tuft of absorbent cotton-wool with acidum phosphoricum dilutum, B. P., and apply repeatedly and with firm pressure over the stain; repeat the procedure two or three times, and finally rinse well in warm water, afterwards drying in the sun, when every trace of ink will have vanished. This method is equally reliable for old and fresh ink stains, is rapid in action, and will not injure the most delicate fabric.

II.—To remove ink spots the fabric is soaked in warm water, then it is squeezed out and spread upon a clean piece of linen. Now apply a few drops of liquid ammonia of a specific gravity of 0.891 to the spot, and dab it next with a wad of cotton which has been saturated with dilute phosphoric acid. After repeating the process several times and drying the piece in the sun, the ink spot will have disappeared without leaving the slightest trace.

III.—Ink spots may be removed by the following mixture:

| | |
|-----------------------|-----------|
| Oxalic acid..... | 10 parts |
| Stannic chloride..... | 2 parts |
| Acetic acid..... | 5 parts |
| Water to make..... | 500 parts |

Mix.

IV.—The customary method of cleansing ink spots is to use oxalic acid. Thick blotting paper is soaked in a concentrated solution and dried. It is then laid immediately on the blot, and in many instances will take the latter out without leaving a trace behind. In more stubborn cases the cloth is dipped in boiling water and rubbed with crystals of oxalic acid, after which it is soaked in a weak solution of chloride of lime—say 1 ounce to a quart of water. Under such circumstances the linen should be thoroughly rinsed in several waters afterwards. Oxalic acid is undesirable for certain fabrics because it removes the color.

V.—Here is a more harmless method: Equal parts of cream of tartar and citric acid, powdered fine, and mixed together. This forms the "salts of lemon" sold by druggists. Procure a hot dinner plate, lay the part stained in the plate, and moisten with hot water; next rub in the above powder with the bowl of a spoon until the stains disappear; then rinse in clean water and dry.

To Remove Red (Aniline) Ink.—Stains of red anilines, except eosine, are at once removed by moistening with alcohol of 94 per cent, acidulated with acetic acid. Eosine does not disappear so easily. The amount of acetic acid to be used is ascertained by adding it, drop by drop, to the alcohol, testing the mixture from time to time, until when dropped on the stain, the latter at once disappears.

CLEANING OF WALLS, CEILINGS, AND WALL PAPER:

See also Household Formulas.

To Renovate Brick Walls.—Dissolve glue in water in the proportion of 1 ounce of glue to every gallon of water; add, while hot, a piece of alum the size of a hen's egg, $\frac{1}{2}$ pound Venetian red, and 1 pound Spanish brown. Add more water if too dark; more red and brown if too light.

Cleaning Painted Doors, Walls, etc.—The following recipe is designed for painted objects that are much soiled. Simmer gently on the fire, stirring constantly, 30 parts, by weight, of pulverized borax, and 450 parts of brown soap of

good quality, cut in small pieces, in 3,000 parts of water. The liquid is applied by means of flannel and rinsed off at once with pure water.

To Remove Aniline Stains from Ceilings, etc.—In renewing ceilings, the old aniline color stains are often very annoying, as they penetrate the new coating. Painting over with shellac or oil paint will bring relief, but other drawbacks appear. A very practical remedy is to place a tin vessel on the floor of the room, and to burn a quantity of sulphur in it after the doors and windows of the room have been closed. The sulphur vapors destroy the aniline stains, which disappear entirely.

Old Ceilings.—In dealing with old ceilings the distemper must be washed off down to the plaster face, all cracks raked out and stopped with putty (plaster of Paris and distemper mixed), and the whole rubbed smooth with pumice stone and water; stained parts should be painted with oil color, and the whole distempered. If old ceilings are in bad condition it is desirable that they should be lined with paper, which should have a coat of weak size before being distempered.

Oil Stains on Wall Paper.—Make a medium thick paste of pipe clay and water, applying it carefully flat upon the oil stain, but avoiding all friction. The paste is allowed to remain 10 to 12 hours, after which time it is very carefully removed with a soft rag. In many cases a repeated action will be necessary until the purpose desired is fully reached. Finally, however, this will be obtained without blurring or destroying the design of the wall paper, unless it be of the cheapest variety. In the case of a light, delicate paper, the paste should be composed of magnesia and benzine.

To Clean Painted Walls.—A simple method is to put a little aqua ammonia in moderately warm water, dampen a flannel with it, and gently wipe over the painted surface. No scrubbing is necessary.

Treatment of Whitewashed Walls.—It is suggested that whitewashed walls which it is desired to paper, with a view to preventing peeling, should be treated with water, after which the scraper should be vigorously used. If the whitewash has been thoroughly soaked it can easily be removed with the scraper. Care should be taken that every part of the wall is well scraped.

Cleaning Wall Paper.—I.—To clean wall paper the dust should first be removed by lightly brushing, preferably with a feather duster, and the surface then gently rubbed with slices of moderately stale bread, the discolored surface of the bread being removed from time to time, so as to expose a fresh portion for use. Care should be taken to avoid scratching the paper with the crust of the bread, and the rubbing should be in one direction, the surface being systematically gone over, as in painting, to avoid the production of streaks.

II.—Mix 4 ounces of powdered pumice with 1 quart of flour, and with the aid of water make a stiff dough. Form the dough into rolls 2 inches in diameter and 6 inches long; sew each roll separately in a cotton cloth, then boil for 40 or 50 minutes, so as to render the mass firm. Allow to stand for several hours, remove the crust, and they are ready for use.

III.—Bread will clean paper; but unless it is properly used the job will be a very tedious one. Select a "tin" loaf at least two days old. Cut off the crust at one end, and rub down the paper, commencing at the top. Do not rub the bread backwards and forwards, but in single strokes. When the end gets dirty take a very sharp knife and pare off a thin layer; then proceed as before.

It is well to make sure that the walls are quite dry before using the bread, or it may smear the pattern. If the room is furnished it will, of course, be necessary to place cloths around the room to catch the crumbs.

IV.—A preparation for cleansing wall paper that often proves much more effectual than ordinary bread, especially when the paper is very dirty, is made by mixing $\frac{1}{2}$ dough and $\frac{1}{2}$ plaster of Paris. This should be made a day before it is needed for use, and should be very gently baked.

If there are any grease spots they should be removed by holding a hot flatiron against a piece of blotting paper placed over them. If this fails, a little fuller's earth or pipe clay should be made into a paste with water, and this should then be carefully plastered over the grease spots and allowed to remain till quite dry, when it will be found to have absorbed the grease.

V.—Mix together 1 pound each of rye flour and white flour into a dough, which is partially cooked and the crust removed. To this 1 ounce common salt and $\frac{1}{2}$ ounce of powdered naphthaline are added, and finally 1 ounce of corn meal, and $\frac{1}{2}$ ounce of burnt umber. The composition is formed into a mass,

of the proper size to be grasped in the hand, and in use it should be drawn in one direction over the surface to be cleaned.

VI.—Procure a soft, flat sponge, being careful that there are no hard or gritty places in it, then get a bucket of new, clean, dry, wheat bran. Hold the sponge flat side up, and put a handful of bran on it, then quickly turn against the wall, and rub the wall gently and carefully with it; then repeat the operation. Hold a large pan or spread down a drip cloth to catch the bran as it falls, but never use the same bran twice. Still another way is to use Canton flannel in strips a foot wide and about 3 yards long. Roll a strip around a stick 1 inch thick and 10 inches long, so as to have the ends of the stick covered, with the nap of the cloth outside. As the cloth gets soiled, unroll the soiled part and roll it up with the soiled face inside.

In this way one can change places on the cloth when soiled and use the whole face of the cloth. To take out a grease spot requires care. First, take several thicknesses of brown wrapping paper and make a pad, place it against the grease spot, and hold a hot flatiron against it to draw out the grease, which will soak into the brown paper. Be careful to have enough layers of brown paper to keep the iron from scorching or discoloring the wall paper. If the first application does not take out nearly all the grease, repeat with clean brown paper or a blotting pad. Then take an ounce vial of washed sulphuric ether and a soft, fine, clean sponge and sponge the spot carefully until all the grease disappears. Do not wipe the place with the sponge and ether, but dab the sponge carefully against the place. A small quantity of ether is advised, as it is very inflammable.

CLOTHES AND FABRIC CLEANERS:

Soaps for Clothing and Fabrics.—When the fabric is washable and the color fast, ordinary soap and water are sufficient for removing grease and the ordinarily attendant dirt; but special soaps are made which may possibly be more effectual.

- I.**—Powdered borax.... 30 parts
Extract of soap bark 30 parts
Ox gall (fresh)..... 120 parts
Castile soap..... 450 parts

First make the soap-bark extract by boiling the crushed bark in water until it has assumed a dark color, then strain the liquid into an evaporating dish, and

by the aid of heat evaporate it to a solid extract; then powder and mix it with the borax and the ox gall. Melt the castile soap by adding a small quantity of water and warming, then add the other ingredients and mix well.

About 100 parts of soap bark make 20 parts of extract.

- II.—Castile soap..... 2 pounds
 Potassium carbonate.. $\frac{1}{2}$ pound
 Camphor..... $\frac{1}{2}$ ounce
 Alcohol..... $\frac{1}{2}$ ounce
 Ammonia water..... $\frac{1}{2}$ ounce
 Hot water, $\frac{1}{2}$ pint, or sufficient.

Dissolve the potassium carbonate in the water, add the soap previously reduced to thin shavings, keep warm over a water bath, stirring occasionally, until dissolved, adding more water if necessary, and finally, when of a consistence to become semisolid on cooling, remove from the fire. When nearly ready to set, stir in the camphor, previously dissolved in the alcohol and the ammonia.

The soap will apparently be quite as efficacious without the camphor and ammonia.

If a paste is desired, a potash soap should be used instead of the castile in the foregoing formula, and a portion or all of the water omitted. Soaps made from potash remain soft, while soda soaps harden on the evaporation of the water which they contain when first made.

A liquid preparation may be obtained, of course, by the addition of sufficient water, and some more alcohol would probably improve it.

Clothes-Cleaning Fluids: See also Household Formulas.

- I.—Borax..... 1 ounce
 Castile soap..... 1 ounce
 Sodium carbonate... 3 drachms
 Ammonia water.... 5 ounces
 Alcohol..... 4 ounces
 Acetone..... 4 ounces
 Hot water to make... 4 pints

Dissolve the borax, sodium bicarbonate, and soap in the hot water, mix the acetone and alcohol together, unite the two solutions, and then add the ammonia water. The addition of a couple of ounces of rose water will render it somewhat fragrant.

II.—A strong decoction of soap bark, preserved by the addition of alcohol, forms a good liquid cleanser for fabrics of the more delicate sort.

- III.—Chloroform..... 15 parts
 Ether..... 15 parts

- Alcohol..... 120 parts
 Decoction of quillaia
 bark of 30°... 4,500 parts

- IV.—Acetic ether..... 10 parts
 Amyl acetate..... 10 parts
 Liquid ammonia.... 10 parts
 Dilute alcohol..... 70 parts

V.—Another good non-inflammable spot remover consists of equal parts of acetone, ammonia, and diluted alcohol. For use in large quantities carbon tetrachloride is suggested.

- VI.—Castile soap..... 4 av. ounces
 Water, boiling.... 32 fluidounces

Dissolve and add:

- Water..... 1 gallon
 Ammonia..... 8 fluidounces
 Ether..... 2 fluidounces
 Alcohol..... 4 fluidounces

To Remove Spots from Tracing Cloth.

—It is best to use benzine, which is applied by means of a cotton rag. The benzine also takes off lead-pencil marks, but does not attack India and other inks. The places treated with benzine should subsequently be rubbed with a little talcum, otherwise it would not be possible to use the pen on them.

Removal of Paint from Clothing.—

Before paint becomes "dry" it can be removed from cloth by the liberal application of turpentine or benzine. If the spot is not large, it may be immersed in the liquid; otherwise, a thick, folded, absorbent cloth should be placed under the fabric which has been spotted, and the liquid sponged on freely enough that it may soak through, carrying the greasy matter with it. Some skill in manipulation is requisite to avoid simply spreading the stain and leaving a "ring" to show how far it has extended.

When benzine is used the operator must be careful to apply it only in the absence of light or fire, on account of the extremely inflammable character of the vapor.

Varnish stains, when fresh, are treated in the same way, but the action of the solvent may possibly not be so complete on account of the gum resins present.

When either paint or varnish has dried, its removal becomes more difficult. In such case soaking in strong ammonia water may answer. An emulsion, formed by shaking together 2 parts of ammonia water and 1 of spirits of turpentine, has been recommended.

To Remove Vaseline Stains from Clothing.—Moisten the spots with a mixture of 1 part of aniline oil, 1 of pow-

dered soap, and 10 of water. After allowing the cloth to lie for 5 or 10 minutes, wash with water.

To Remove Grease Spots from Plush.

—Place fresh bread rolls in the oven, break them apart as soon as they have become very hot, and rub the spots with the crumbs, continuing the work by using new rolls until all traces of fat have disappeared from the fabric. Purified benzine, which does not alter even the most delicate colors, is also useful for this purpose.

To Remove Iron Rust from Muslin and Linen.—Wet with lemon juice and salt and expose to the sun. If one application does not remove the spots, a second rarely fails to do so.

Keroclean.—This non-inflammable cleanser removes grease spots from delicate fabrics without injury, cleans all kinds of jewelry and tableware by removing fats and tarnish, kills moths, insects, and household pests by suffocation and extermination, and cleans ironware by removing rust, brassware by removing grease, copperware by removing verdigris. It is as clear as water and will stand any fire test.

Kerosene..... 1 ounce
Carbon tetrachloride
(commercial)..... 3 ounces
Oil of citronella..... 2 drachms

Mix, and filter if necessary. If a strong odor of carbon bisulphide is detected in the carbon tetrachloride first shake with powdered charcoal and filter.

To Clean Gold and Silver Lace.—I.—Alkaline liquids sometimes used for cleaning gold lace are unsuitable, for they generally corrode or change the color of the silk. A solution of soap also interferes with certain colors, and should therefore not be employed. Alcohol is an effectual remedy for restoring the luster of gold, and it may be used without any danger to the silk, but where the gold is worn off, and the base metal exposed, it is not so successful in accomplishing its purpose, as by removing the tarnish the base metal becomes more distinguishable from the fine gold.

II.—To clean silver lace take alabaster in very fine powder, lay the lace upon a cloth, and with a soft brush take up some of the powder, and rub both sides with it till it becomes bright and clean, afterwards polish with another brush until all remnants of the powder are removed, and it exhibits a lustrous surface.

III.—Silver laces are put in curdled

milk for 24 hours. A piece of Venetian soap, or any other good soap, is scraped and stirred into 2 quarts of rain water. To this a quantity of honey and fresh ox gall is added, and the whole is stirred for some time. If it becomes too thick, more water is added. This mass is allowed to stand for half a day, and the wet laces are painted with it. Wrap a wet cloth around the roller of a mangle, wind the laces over this, put another wet cloth on top, and press, wetting and repeating the application several times. Next, dip the laces in a clear solution of equal parts of sugar and gum arabic, pass them again through the mangle, between two clean pieces of cloth, and hang them up to dry thoroughly, attaching a weight to the lower end.

IV.—Soak gold laces over night in cheap white wine and then proceed as with silver laces. If the gold is worn off, put 771 grains of shellac, 31 grains of dragon's blood, 31 grains of turmeric in strong alcohol and pour off the ruby-colored fluid. Dip a fine hair pencil in this, paint the pieces to be renewed, and hold a hot flatiron a few inches above them, so that only the laces receive the heat.

V.—Silver embroideries may also be cleaned by dusting them with Vienna lime, and brushing off with a velvet brush.

For gildings the stuff is dipped in a solution of gold chloride, and this is reduced by means of hydrogen in another vessel.

For silvering, one of the following two processes may be employed: (a) Painting with a solution of 1 part of phosphorus in 15 parts bisulphide of carbon and dipping in a solution of nitrate of silver; (b) dipping for 2 hours in a solution of nitrate of silver, mixed with ammonia, then exposing to a current of pure hydrogen.

To Remove Silver Stains from White Fabrics.—Moisten the fabric for two or three minutes with a solution of 5 parts of bromine and 500 parts of water. Then rinse in clear water. If a yellowish stain remains, immerse in a solution of 150 parts of sodium hyposulphite in 500 parts of water, and again rinse in clear water.

Rust-Spot Remover.—Dissolve potassium binoxalate, 200 parts, in distilled water, 8,800 parts; add glycerine, 1,000 parts, and filter. Moisten the rust or ink spots with this solution; let the linen, etc., lie for 3 hours, rubbing the moistened spots frequently, and then wash well with water.

To Clean Quilts.—Quilts are cleaned by first washing them in lukewarm soap-suds, then laying them in cold, soft (rain) water over night. The next day they are pressed as dry as possible and hung up; the ends, in which the moisture remains for a long time, must be wrung out from time to time.

It is very essential to beat the drying quilts frequently with a smooth stick or board. This will have the effect of swelling up the wadding, and preventing it from felting. Furthermore, the quilts should be repeatedly turned during the drying from right to left and also from top to bottom. In this manner streaks are avoided.

Removal of Peruvian-Balsam Stains.

—The fabric is spread out, a piece of filter paper being placed beneath the stain, and the latter is then copiously moistened with chloroform, applied by means of a tuft of cotton wool. Rubbing is to be avoided.

Solution for Removing Nitrate of Silver Spots.—

Bichloride of mercury 5 parts
Ammonium chloride. 5 parts
Distilled water..... 40 parts

Apply the mixture to the spots with a cloth, then rub. This removes, almost instantaneously, even old stains on linen, cotton, or wool. Stains on the skin thus treated become whitish yellow and soon disappear.

Cleaning Tracings.—Tracing cloth can be very quickly and easily cleaned, and pencil marks removed by the use of benzine, which is applied with a cotton swab. It may be rubbed freely over the tracing without injury to lines drawn in ink, or even in water color, but the pencil marks and dirt will quickly disappear. The benzine evaporates almost immediately, leaving the tracing unharmed. The surface, however, has been softened and must be rubbed down with talc, or some similar substance, before drawing any more ink lines.

The glaze may be restored to tracing cloth after using the eraser by rubbing the roughened surface with a piece of hard wax from an old phonograph cylinder. The surface thus produced is superior to that of the original glaze, as it is absolutely oil- and water-proof.

Rags for Cleaning and Polishing.—

Immerse flannel rags in a solution of 20 parts of dextrine and 30 parts of oxalic acid in 20 parts of logwood decoction; gently wring them out, and sift over them a mixture of finely powdered tripoli and

pumice stone. Pile the moist rags one upon another, placing a layer of the powder between each two. Then press, separate, and dry.

Cleaning Powder.—

Bole..... 500 parts
Magnesium carbonate..... 50 parts

Mix and make into a paste with a small quantity of benzine or water; apply to stains made by fats or oils on the clothing and when dry remove with a brush.

CLEANING PAINTED AND VARNISHED SURFACES:

Cleaning and Preserving Polished Woodwork.—Rub down all the polished work with a very weak alcoholic solution of shellac (1 to 20 or even 1 to 30) and linseed oil, spread on a linen cloth. The rubbing should be firm and hard. Spots on the polished surface, made by alcohol, tinctures, water, etc., should be removed as far as possible and as soon as possible after they are made, by the use of boiled linseed oil. Afterwards they should be rubbed with the shellac and linseed oil solution on a soft linen rag. If the spots are due to acids go over them with a little dilute ammonia water. Ink spots may be removed with dilute or (if necessary) concentrated hydrochloric acid, following its use with dilute ammonia water. In extreme cases it may be necessary to use the scraper or sandpaper, or both.

Oak as a general thing is not polished, but has a matt surface which can be washed with water and soap. First all stains and spots should be gone over with a sponge or a soft brush and very weak ammonia water. The carved work should be freed of dust, etc., by the use of a stiff brush, and finally washed with dilute ammonia water. When dry it should be gone over very thinly and evenly with brunoline applied with a soft pencil. If it is desired to give an especially handsome finish, after the surface is entirely dry, give it a preliminary coat of brunoline and follow this on the day after with a second. Brunoline may be purchased of any dealer in paints. To make it, put 70 parts of linseed oil in a very capacious vessel (on account of the foam that ensues) and add to it 20 parts of powdered litharge, 20 parts of powdered minium, and 10 parts of lead acetate, also powdered. Boil until the oil is completely oxidized, stirring constantly. When completely oxidized the oil is no longer red, but is of a dark brown color. When it acquires

this color, remove from the fire, and add 160 parts of turpentine oil, and stir well. This brunoline serves splendidly for polishing furniture or other polished wood.

To Clean Lacquered Goods.—Papier-maché and lacquered goods may be cleaned perfectly by rubbing thoroughly with a paste made of wheat flour and olive oil. Apply with a bit of soft flannel or old linen, rubbing hard; wipe off and polish by rubbing with an old silk handkerchief.

Polish for Varnished Work.—To renovate varnished work make a polish of 1 quart good vinegar, 2 ounces butter of antimony, 2 ounces alcohol, and 1 quart oil. Shake well before using.

To Clean Paintings.—To clean an oil painting, take it out of its frame, lay a piece of cloth moistened with rain water on it, and leave it for a while to take up the dirt from the picture. Several applications may be required to secure a perfect result. Then wipe the picture very gently with a tuft of cotton wool damped with absolutely pure linseed oil. Gold frames may be cleaned with a freshly cut onion; they should be wiped with a soft sponge wet with rain water a few hours after the application of the onion, and finally wiped with a soft rag.

Removing and Preventing Match Marks.—The unsightly marks made on a painted surface by striking matches on it can sometimes be removed by scrubbing with soapsuds and a stiff brush. To prevent match marks dip a bit of flannel in alboline (liquid vaseline), and with it go over the surface, rubbing it hard. A second rubbing with a dry bit of flannel completes the job. A man may "strike" a match there all day, and neither get a light nor make a mark.

GLOVE CLEANERS:

Powder for Cleaning Gloves.—

- I.—White bole or pipe clay..... 60.0 parts
- Orris root (powdered)..... 30.0 parts
- Powdered grain soap..... 7.5 parts
- Powdered borax... 15.0 parts
- Ammonium chloride..... 2.5 parts

Mix the above ingredients. Moisten the gloves with a damp cloth, rub on the powder, and brush off after drying.

- II.—Four pounds powdered pipe clay, 2 pounds powdered white soap, 1 ounce

lemon oil, thoroughly rubbed together. To use, make powder into a thin cream with water and rub on the gloves while on the hands. This is a cheaply produced compound, and does its work effectually.

Soaps and Pastes for Cleaning Gloves.—

- I.—Soft soap..... 1 ounce
- Water..... 4 ounces
- Oil of lemon..... $\frac{1}{2}$ drachm
- Precipitated chalk, a sufficient quantity.

Dissolve the soap in the water, add the oil, and make into a stiff paste with a sufficient quantity of chalk.

- II.—White hard soap.... 1 part
- Talcum..... 1 part
- Water..... 4 parts

Shave the soap into ribbons, dissolve in the water by the aid of heat, and incorporate the talcum.

- III.—Curd soap..... 1 av. ounce
- Water..... 4 fluidounces
- Oil of lemon..... $\frac{1}{2}$ fluidrachm
- French chalk, a sufficient quantity.

Shred the soap and melt it in the water by heat, add the oil of lemon, and make into a stiff paste with French chalk.

- IV.—White castile soap, old and dry..... 15 parts
- Water..... 15 parts
- Solution of chlorinated soda..... 16 parts
- Ammonia water... 1 part

Cut or shave up the soap, add the water, and heat on the water bath to a smooth paste. Remove, let cool, and add the other ingredients and mix thoroughly.

- V.—Castile soap, white, old, and dry..... 100 parts
- Water..... 75 parts
- Tincture of quillaia 10 parts
- Ether, sulphuric... 10 parts
- Ammonia water, FF..... 5 parts
- Benzine, deodorized 75 parts

Melt the soap, previously finely shaved, in the water, bring to a boil and remove from the fire. Let cool down, then add the other ingredients, incorporating them thoroughly. This should be put up in collapsible tubes or tightly closed metallic boxes. This is also useful for clothing.

Liquid Cloth and Glove Cleaner.—

- Gasoline..... 1 gallon
- Chloroform..... 1 ounce
- Carbon disulphide... 1 ounce

| | |
|------------------------|----------|
| Essential oil almond.. | 5 drops |
| Oil bergamot..... | 1 drachm |
| Oil cloves..... | 5 drops |

Mix. To be applied with a sponge or soft cloth.

STONE CLEANING:

Cleaning and Polishing Marble.—
I.—Marble that has become dirty by ordinary use or exposure may be cleaned by a simple bath of soap and water.

If this does not remove stains, a weak solution of oxalic acid should be applied with a sponge or rag, washing quickly and thoroughly with water to minimize injury to the surface.

Rubbing well after this with chalk moistened with water will, in a measure, restore the luster. Another method of finishing is to apply a solution of white wax in turpentine (about 1 in 10), rubbing thoroughly with a piece of flannel or soft leather.

If the marble has been much exposed, so that its luster has been seriously impaired, it may be necessary to repolish it in a more thorough manner. This may be accomplished by rubbing it first with sand, beginning with a moderately coarse-grained article and changing this twice for finer kinds, after which tripoli or pumice is used. The final polish is given by the so-called putty powder. A plate of iron is generally used in applying the coarse sand; with the fine sand a leaden plate is used; and the pumice is employed in the form of a smooth-surfaced piece of convenient size. For the final polishing coarse linen or bagging is used, wedged tightly into an iron planing tool. During all these applications water is allowed to trickle over the face of the stone.

The putty powder referred to is bin-oxide of tin, obtained by treating metallic tin with nitric acid, which converts the metal into hydrated metastannic acid. This, when heated, becomes anhydrous. In this condition it is known as putty powder. In practice putty powder is mixed with alum, sulphur, and other substances, the mixture used being dependent upon the nature of the stone to be polished.

According to Warwick, colored marble should not be treated with soap and water, but only with the solution of bees-wax above mentioned.

II.—Take 2 parts of sodium bicarbonate, 1 part of powdered pumice stone, and 1 part of finely pulverized chalk. Pass through a fine sieve to screen out all particles capable of scratching the marble, and add sufficient water to form

a pasty mass. Rub the marble with it vigorously, and end the cleaning with soap and water.

III.—Ox gall..... 1 part
Saturated solution
of sodium carbo-
nate..... 4 parts
Oil of turpentine.. 1 part
Pipe clay enough to form a paste.

IV.—Sodium carbonate. 2 ounces
Chlorinated lime.. 1 ounce
Water..... 14 ounces

Mix well and apply the magma to the marble with a cloth, rubbing well in, and finally rubbing dry. It may be necessary to repeat this operation.

V.—Wash the surface with a mixture of finely powdered pumice stone and vinegar, and leave it for several hours; then brush it hard and wash it clean. When dry, rub with whiting and wash leather.

VI.—Soft soap..... 4 parts
Whiting 4 parts
Sodium bicarbonate 1 part
Copper sulphate... 2 parts

Mix thoroughly and rub over the marble with a piece of flannel, and leave it on for 24 hours, then wash it off with clean water, and polish the marble with a piece of flannel or an old piece of felt.

VII.—A strong solution of oxalic acid effectually takes out ink stains. In handling it the poisonous nature of this acid should not be forgotten.

VIII.—Iron mold or ink spots may be taken out in the following manner: Take $\frac{1}{2}$ ounce of butter of antimony and 1 ounce of oxalic acid and dissolve them in 1 pint of rain water; add enough flour to bring the mixture to a proper consistency. Lay it evenly on the stained part with a brush, and, after it has remained for a few days, wash it off and repeat the process if the stain is not wholly removed.

IX.—To remove oil stains apply common clay saturated with benzine. If the grease has remained in long the polish will be injured, but the stain will be removed.

X.—The following method for removing rust from iron depends upon the solubility of the sulphide of iron in a solution of cyanide of potassium. Clay is made into a thin paste with ammonium sulphide, and the rust spot smeared with the mixture, care being taken that the spot is only just covered. After ten minutes this paste is washed off and replaced by one consisting of white bole mixed with a solution of potassium cyanide (1 to 4), which is in its turn

washed off after about 2½ hours. Should a reddish spot remain after washing off the first paste, a second layer may be applied for about 5 minutes.

XI.—Soft soap..... 4 ounces
Whiting..... 4 ounces
Sodium carbonate. 1 ounce
Water, a sufficient quantity.

Make into a thin paste, apply on the soiled surface, and wash off after 24 hours.

XII.—In a spacious tub place a tall vessel upside down. On this set the article to be cleaned so that it will not stand in the water, which would loosen the cemented parts. Into this tub pour a few inches of cold water—hot water renders marble dull—take a soft brush and a piece of Venetian soap, dip the former in the water and rub on the latter carefully, brushing off the article from top to bottom. When in this manner dust and dirt have been dissolved, wash off all soap particles by means of a watering pot and cold water, dab the object with a clean sponge, which absorbs the moisture, place it upon a cloth and carefully dry with a very clean, soft cloth, rubbing gently. This treatment will restore the former gloss to the marble.

XIII.—Mix and shake thoroughly in a bottle equal quantities of sulphuric acid and lemon juice. Moisten the spots and rub them lightly with a linen cloth and they will disappear.

XIV.—Ink spots are treated with acid oxalate of potassium; blood stains by brushing with alabaster dust and distilled water, then bleaching with chlorine solution. Alizarine ink and aniline ink spots can be moderated by laying on rags saturated with Javelle water, chlorine water, or chloride of lime paste. Old oil stains can only be effaced by placing the whole piece of marble for hours in benzine. Fresh oil or grease spots are obliterated by repeated applications of a little damp, white clay and subsequent brushing with soap water or weak soda solution. For many other spots an application of benzine and magnesia is useful.

XV.—Marble slabs keep well and do not lose their fresh color if they are cleaned with hot water only, without the addition of soap, which is injurious to the color. Care must be taken that no liquid dries on the marble. If spots of wine, coffee, beer, etc., have already appeared, they are cleaned with diluted spirit of sal ammoniac, highly diluted oxalic acid, Javelle water, ox gall, or, take a quantity of newly slaked lime, mix it with water into a paste-like consistency,

apply the paste uniformly on the spot with a brush, and leave the coating alone for two to three days before it is washed off. If the spots are not removed by a single application, repeat the latter. In using Javelle water 1 or 2 drops should be carefully poured on each spot, rinsing off with water.

To Remove Grease Spots from Marble.

—If the spots are fresh, rub them over with a piece of cloth that has been dipped into pulverized china clay, repeating the operation several times, and then brush with soap and water. When the spots are old brush with distilled water and finest French plaster energetically, then bleach with chloride of lime that is put on a piece of white cloth. If the piece of marble is small enough to permit it, soak it for a few hours in refined benzine.

Preparation for Cleaning Marble, Furniture, and Metals, Especially Copper.—This preparation is claimed to give very quickly perfect brilliancy, persisting without soiling either the hand or the articles, and without leaving any odor of copper. The following is the composition for 100 parts of the product: Wax, 2.4 parts; oil of turpentine, 9.4 parts; acetic acid, 42 parts; citric acid, 42 parts; white soap, 42 parts.

Removing Oil Stains from Marble.—

Saturate fuller's earth with a solution of equal parts of soap liniment, ammonia, and water; apply to the greasy part of the marble; keep there for some hours, pressed down with a smoothing iron sufficiently hot to warm the mass, and as it evaporates occasionally renew the solution. When wiped off dry the stain will have nearly disappeared. Some days later, when more oil works toward the surface repeat the operation. A few such treatments should suffice.

Cleaning Terra Cotta.—After having carefully removed all dust, paint the terra cotta, by means of a brush, with a mixture of slightly gummed water and finely powdered terra cotta.

Renovation of Polished and Varnished Surfaces of Wood, Stone, etc.—This is composed of the following ingredients, though the proportions may be varied: Cereal flour or wood pulp, 38½ parts; hydrochloric acid, 45 parts; chloride of lime, 16 parts; turpentine, ½ part. After mixing the ingredients thoroughly in order to form a homogeneous paste, the object to be treated is smeared with it and allowed to stand for some time. The paste on the surface is then removed by passing over it quickly a piece of soft

leather or a brush, which will remove dirt, grease, and other deleterious substances. By rubbing gently with a cloth or piece of leather a polished surface will be imparted to wood, and objects of metal will be rendered lustrous.

The addition of chloride of lime tends to keep the paste moist, thus allowing the ready removal of the paste without damaging the varnish or polish, while the turpentine serves as a disinfectant and renders the odor less disagreeable during the operation.

The preparation is rapid in its action, and does not affect the varnished or polished surfaces of wood or marble. While energetic in its cleansing action on brass and other metallic objects, it is attended with no corrosive effect.

Nitrate of Silver Spots.—To remove these spots from white marble, they should be painted with Javelle water, and after having been washed, passed over a concentrated solution of thiosulphate of soda (hyposulphite).

To Remove Oil-Paint Spots from Sandstones.—This may be done by washing the spots with pure turpentine oil, then covering the place with white argillaceous earth (pipe clay), leaving it to dry, and finally rubbing with sharp soda lye, using a brush. Caustic ammonia also removes oil-paint spots from sandstones.

RUST REMOVERS:

To Remove Rust from Iron or Steel Utensils.—

I.—Apply the following solution by means of a brush, after having removed any grease by rubbing with a clean, dry cloth: 100 parts of stannic chloride are dissolved in 1,000 parts of water; this solution is added to one containing 2 parts tartaric acid dissolved in 1,000 parts of water, and finally 20 cubic centimeters indigo solution, diluted with 2,000 parts of water, are added. After allowing the solution to act upon the stain for a few seconds, it is rubbed clean, first with a moist cloth, then with a dry cloth; to restore the polish use is made of silver sand and jewelers' rouge.

II.—When the rust is recent it is removed by rubbing the metal with a cork charged with oil. In this manner a perfect polish is obtained. To take off old rust, mix equal parts of fine tripoli and flowers of sulphur, mingling this mixture with olive oil, so as to form a paste. Rub the iron with this preparation by means of a skin.

III.—The rusty piece is connected with a piece of zinc and placed in water

containing a little sulphuric acid. After the articles have been in the liquid for several days or a week, the rust will have completely disappeared. The length of time will depend upon the depth to which the rust has penetrated. A little sulphuric acid may be added from time to time, but the chief point is that the zinc always has good electric contact with the iron. To insure this an iron wire may be firmly wound around the iron object and connected with the zinc. The iron is not attacked in the least, as long as the zinc is kept in good electric contact with it. When the articles are taken from the liquid they assume a dark gray or black color and are then washed and oiled.

IV.—The rust on iron and steel objects, especially large pieces, is readily removed by rubbing the pieces with oil of tartar, or with very fine emery and a little oil, or by putting powdered alum in strong vinegar and rubbing with this alumed vinegar.

V.—Take cyanide of calcium, 25 parts; white soap, powdered, 25 parts; Spanish white, 50 parts; and water, 200 parts. Triturate all well and rub the piece with this paste. The effect will be quicker if before using this paste the rusty object has been soaked for 5 to 10 minutes in a solution of cyanide of potassium in the ratio of 1 part of cyanide to 2 parts of water.

VI.—To remove rust from polished steel cyanide of potassium is excellent. If possible, soak the instrument to be cleaned in a solution of cyanide of potassium in the proportion of 1 ounce of cyanide to 4 ounces of water. Allow this to act till all loose rust is removed, and then polish with cyanide soap. The latter is made as follows: Potassium cyanide, precipitated chalk, white castile soap. Make a saturated solution of the cyanide and add chalk sufficient to make a creamy paste. Add the soap cut in fine shavings and thoroughly incorporate in a mortar. When the mixture is stiff cease to add the soap. It should be remembered that potassium cyanide is a virulent poison.

VII.—Apply turpentine or kerosene oil, and after letting it stand over night, clean with finest emery cloth.

VIII.—To free articles of iron and steel from rust and imbedded grains of sand the articles are treated with fluorhydric acid (about 2 per cent) 1 to 2 hours, whereby the impurities but not the metal are dissolved. This is followed by a washing with lime milk, to neutralize any fluorhydric acid remaining.

To Remove Rust from Nickel.—First grease the articles well; then, after a few days, rub them with a rag charged with ammonia. If the rust spots persist, add a few drops of hydrochloric acid to the ammonia, rub and wipe off at once. Next rinse with water, dry, and polish with tripoli.

Removal of Rust.—To take off the rust from small articles which glass or emery paper would bite too deeply, the ink-erasing rubber used in business offices may be employed. By beveling it, or cutting it to a point as needful, it can be introduced into the smallest cavities and windings, and a perfect cleaning be effected.

To Remove Rust from Instruments.—
I.—Lay the instruments over night in a saturated solution of chloride of tin. The rust spots will disappear through reduction. Upon withdrawal from the solution the instruments are rinsed with water, placed in a hot soda-soap solution, and dried. Cleaning with absolute alcohol and polishing chalk may also follow.

II.—Make a solution of 1 part of kerosene in 200 parts of benzine or carbon tetrachloride, and dip the instruments, which have been dried by leaving them in heated air, in this, moving their parts, if movable, as in forceps and scissors, about under the liquid, so that it may enter all the crevices. Next lay the instruments on a plate in a dry room, so that the benzine can evaporate. Needles are simply thrown in the paraffine solution, and taken out with tongs or tweezers, after which they are allowed to dry on a plate.

III.—Pour olive oil on the rust spots and leave for several days; then rub with emery or tripoli, without wiping off the oil as far as possible, or always bringing it back on the spot. Afterwards remove the emery and the oil with a rag, rub again with emery soaked with vinegar, and finally with fine plumbago on a piece of chamois skin.

To Preserve Steel from Rust.—To preserve steel from rust dissolve 1 part caoutchouc and 16 parts turpentine with a gentle heat, then add 8 parts boiled oil, and mix by bringing them to the heat of boiling water. Apply to the steel with a brush, the same as varnish. It can be removed again with a cloth soaked in turpentine.

METAL CLEANING:

Cleaning and Preserving Medals, Coins, and Small Iron Articles.—The

coating of silver chloride may be reduced with molten potassium cyanide. Then boil the article in water, displace the water with alcohol, and dry in a drying closet. When dry brush with a soft brush and cover with "zaponlack" (any good transparent lacquer or varnish will answer).

Instead of potassium cyanide alone, a mixture of that and potassium carbonate may be used. After treatment in this way, delicate objects of silver become less brittle. Another way is to put the article in molten sodium carbonate and remove the silver carbonate thus formed, by acetic acid of 50 per cent strength. This process produces the finest possible polish.

The potassium-cyanide process may be used with all small iron objects. For larger ones molten potassium rhodanide is recommended. This converts the iron oxide into iron sulphide that is easily washed off and leaves the surface of a fine black color.

Old coins may be cleansed by first immersing them in strong nitric acid and then washing them in clean water. Wipe them dry before putting away.

To Clean Old Medals.—Immerse in lemon juice until the coating of oxide has completely disappeared; 24 hours is generally sufficient, but a longer time is not harmful.

Steel Cleaner.—Smear the object with oil, preferably petroleum, and allow some days for penetration of the surface of the metal. Then rub vigorously with a piece of flannel or willow wood. Or, with a paste composed of olive oil, sulphur flowers, and tripoli, or of rotten stone and oil. Finally, a coating may be employed, made of 10 parts of potassium cyanide and 1 part of cream of tartar; or 25 parts of potassium cyanide, with the addition of 55 parts of carbonate of lime and 20 parts of white soap.

Restoring Tarnished Gold.—

| | |
|----------------------|-----------|
| Sodium bicarbonate. | 20 ounces |
| Chlorinated lime.... | 1 ounce |
| Common salt..... | 1 ounce |
| Water..... | 16 ounces |

Mix well and apply with a soft brush.

A very small quantity of the solution is sufficient, and it may be used either cold or lukewarm. Plain articles may be brightened by putting a drop or two of the liquid upon them and lightly brushing the surface with fine tissue paper.

Cleaning Copper.—

I.—Use Armenian bole mixed into a paste with oleic acid.

II.—Rotten stone..... 1 part
Iron subcarbonate.. 3 parts
Lard oil, a sufficient quantity.

III.—Iron oxide..... 10 parts
Pumice stone..... 32 parts
Oleic acid, a sufficient quantity.

IV.—Soap, cut fine..... 16 parts
Precipitated chalk.. 2 parts
Jewelers' rouge..... 1 part
Cream of tartar..... 1 part
Magnesium carbonate 1 part
Water, a sufficient quantity.

Dissolve the soap in the smallest quantity of water that will effect solution over a water bath. Add the other ingredients to the solution while still hot, stirring constantly.

To Remove Hard Grease, Paint, etc., from Machinery.—To remove grease, paint, etc., from machinery add half a pound of caustic soda to 2 gallons of water and boil the parts to be cleaned in the fluid. It is possible to use it several times before its strength is exhausted.

Solutions for Cleaning Metals.—

I.—Water..... 20 parts
Alum..... 2 parts
Tripoli..... 2 parts
Nitric acid..... 1 part

II.—Water..... 40 parts
Oxalic acid..... 2 parts
Tripoli..... 7 parts

To Cleanse Nickel.—I.—Fifty parts of rectified alcohol; 1 part of sulphuric acid; 1 part of nitric acid. Plunge the piece in the bath for 10 to 15 seconds, rinse it off in cold water, and dip it next into rectified alcohol. Dry with a fine linen rag or with sawdust.

II.—Stearine oil..... 1 part
Ammonia water..... 25 parts
Benzine..... 50 parts
Alcohol..... 75 parts

Rub up the stearine with the ammonia, add the benzine and then the alcohol, and agitate until homogeneous. Put in wide-mouthed vessels and close carefully.

To Clean Petroleum Lamp Burners.—Dissolve in a quart of soft water an ounce or an ounce and a half of washing soda, using an old half-gallon tomato can. Into this put the burner after removing the wick, set it on the stove, and let it boil strongly for 5 or 6 minutes, then take out, rinse under the tap, and dry.

Every particle of carbonaceous matter will thus be got rid of, and the burner be as clean and serviceable as new. This ought to be done at least every month, but the light would be better if it were done every 2 weeks.

Gold-Ware Cleaner.—

Acetic acid..... 2 parts
Sulphuric acid..... 2 parts
Oxalic acid..... 1 part
Jewelers' rouge..... 2 parts
Distilled water..... 200 parts

Mix the acids and water and stir in the rouge, after first rubbing it up with a portion of the liquid. With a clean cloth, wet with this mixture, go well over the article. Rinse off with hot water and dry.

Silverware Cleaner.—Make a thin paste of levigated (not precipitated) chalk and sodium hyposulphite, in equal parts, rubbed up in distilled water. Apply this paste to the surface, rubbing well with a soft brush. Rinse in clear water and dry in sawdust. Some authorities advise the cleaner to let the paste dry on the ware, and then to rub off and rinse with hot water.

Silver-Coin Cleaner.—Make a bath of 10 parts of sulphuric acid and 90 parts of water, and let the coin lie in this until the crust of silver sulphide is dissolved. From 5 to 10 minutes usually suffice. Rinse in running water, then rub with a soft brush and castile soap, rinse again, dry with a soft cloth, and then carefully rub with chamois.

Cleaning Silver-Plated Ware.—Into a wide-mouthed bottle provided with a good cork put the following mixture:

Cream of tartar..... 2 parts
Levigated chalk..... 2 parts
Alum..... 1 part

Powder the alum and rub up with the other ingredients, and cork tightly. When required for use wet sufficient of the powder and with soft linen rags rub the article, being careful not to use much pressure, as otherwise the thin layer of plating may be cut through. Rinse in hot suds, and afterwards in clear water, and dry in sawdust. When badly blackened with silver sulphide, if small, the article may be dipped for an instant in hydrochloric acid and immediately rinsed in running water. Larger articles may be treated as coins are—immersed for 2 or 3 minutes in a 10 per cent aqueous solution of sulphuric acid, or the surface may be rapidly wiped

with a swab carrying nitric acid and instantly rinsed in running water.

Cleaning Gilt Bronze Ware.—If greasy, wash carefully in suds, or, better, dip into a hot solution of caustic potash, and then wash in suds with a soft rag, and rinse in running water. If not then clean and bright, dip into the following mixture:

Nitric acid..... 10 parts
Aluminum sulphate.. 1 part
Water..... 40 parts

Mix. Rinse in running water.

Britannia Metal Cleaner.—Rub first with jewelers' rouge made into a paste with oil; wash in suds, rinse, dry, and finish with chamois or wash leather.

To Remove Ink Stains on Silver.—Silver articles in domestic use, and especially silver or plated inkstands, frequently become badly stained with ink. These stains cannot be removed by ordinary processes, but readily yield to a paste of chloride of lime and water. Javelle water may be also used.

Removing Egg Stains.—A pinch of table salt taken between the thumb and finger and rubbed on the spot with the end of the finger will usually remove the darkest egg stain from silver.

To Clean Silver Ornaments.—Make a strong solution of soft soap and water, and in this boil the articles for a few minutes—five will usually be enough. Take out, pour the soap solution into a basin, and as soon as the liquid has cooled down sufficiently to be borne by the hand, with a soft brush scrub the articles with it. Rinse in boiling water and place on a porous substance (a bit of tiling, a brick, or unglazed earthenware) to dry. Finally give a light rubbing with a chamois. Articles thus treated look as bright as new.

Solvent for Iron Rust.—Articles attacked by rust may be conveniently cleaned by dipping them into a well-saturated solution of stannic chloride. The length of time of the action must be regulated according to the thickness of the rust. As a rule 12 to 24 hours will suffice, but it is essential to prevent an excess of acid in the bath, as this is liable to attack the iron itself. After the objects have been removed from the bath they must be rinsed with water, and subsequently with ammonia, and then quickly dried. Greasing with vaseline seems to prevent new formation of rust. Objects treated in this manner are said to resemble dead silver.

Professor Weber proposed a diluted

alkali, and it has been found that after employing this remedy the dirt layer is loosened and the green patina reappears. Potash has been found to be an efficacious remedy, even in the case of statues that had apparently turned completely black.

To Clean Polished Parts of Machines.

—Put in a flask 1,000 parts of petroleum; add 20 parts of paraffine, shaved fine; cork the bottle and stand aside for a couple of days, giving it an occasional shake. The mixture is now ready for use. To use, shake the bottle, pour a little of the liquid upon a woolen rag and rub evenly over the part to be cleaned; or apply with a brush. Set the article aside and, next day, rub it well with a dry, woolen rag. Every particle of rust, resinified grease, etc., will disappear provided the article has not been neglected too long. In this case a further application of the oil will be necessary. If too great pressure has not been made, or the rubbing continued too long, the residual oil finally leaves the surface protected by a delicate layer of paraffine that will prevent rusting for a long time.

To Clean Articles of Nickel.—Lay them for a few seconds in alcohol containing 2 per cent of sulphuric acid; remove, wash in running water, rinse in alcohol, and rub dry with a linen cloth. This process gives a brilliant polish and is especially useful with plated articles on the plating of which the usual polishing materials act very destructively. The yellowest and brownest nicked articles are restored to pristine brilliancy by leaving them in the alcohol and acid for 15 seconds. Five seconds suffice ordinarily.

How to Renovate Bronzes.—For gilt work, first remove all grease, dirt, wax, etc., with a solution in water of potassium or sodium hydrate, then dry, and with a soft rag apply the following:

Sodium carbonate.. 7 parts
Spanish whiting.... 15 parts
Alcohol, 85 per cent 50 parts
Water..... 125 parts

Go over every part carefully, using a brush to get into the minute crevices. When this dries on, brush off with a fine linen cloth or a supple chamois skin.

Or the following plan may be used: Remove grease, etc., as directed above, dry and go over the spots where the gilt surface is discolored with a brush dipped in a solution of two parts of alum in 250 parts of water and 65 parts of nitric acid. As soon as the gilding reappears or the

surface becomes bright, wash off, and dry in the direct sunlight.

Still another cleaner is made of nitric acid, 30 parts; aluminum sulphate, 4 parts; distilled or rain water, 125 parts. Clean of grease, etc., as above, and apply the solution with a camel's-hair pencil. Rinse off and dry in sawdust. Finally, some articles are best cleaned by immersing in hot soap suds and rubbing with a soft brush. Rinse in clear, hot water, using a soft brush to get the residual suds out of crevices. Let dry, then finish by rubbing the gilt spots or places with a soft, linen rag, or a bit of chamois.

There are some bronzes gilt with imitation gold and varnished. Where the work is well done and the gilding has not been on too long, they will deceive even the practiced eye. The deception, however, may easily be detected by touching a spot on the gilt surface with a glass rod dipped in a solution of corrosive sublimate. If the gilding is true no discoloration will occur, but if false a brown spot will be produced.

To Clean a Gas Stove.—An easy method of removing grease spots consists in immersing the separable parts for several hours in a warm lye, heated to about 70° C. (158° F.), said lye to be made of 9 parts of caustic soda and 180 parts of water. These pieces, together with the fixed parts of the stove, may be well brushed with this lye and afterwards rinsed in clean, warm water. The grease will be dissolved, and the stove restored almost to its original state.

Cleaning Copper Sinks.—Make rotten stone into a stiff paste with soft soap and water. Rub on with a woolen rag, and polish with dry whiting and rotten stone. Finish with a leather and dry whiting. Many of the substances and mixtures used to clean brass will effectively clean copper. Oxalic acid is said to be the best medium for cleaning copper, but after using it the surface of the copper must be well washed, dried, and then rubbed with sweet oil and tripoli, or some other polishing agent. Otherwise the metal will soon tarnish again.

Treatment of Cast-Iron Grave Crosses.—The rust must first be thoroughly removed with a steel-wire brush. When this is done apply one or two coats of red lead or graphite paint. After this priming has become hard, paint with double-burnt lampblack and equal parts of oil of turpentine and varnish. This coating is followed by one of lampblack ground with coach varnish. Now paint the sin-

gle portions with "mixture" (gilding oil) and gild as usual. Such crosses look better when they are not altogether black. Ornaments may be very well treated in colors with oil paint and then varnished. The crosses treated in this manner are preserved for many years, but it is essential to use good exterior or coach varnish for varnishing, and not the so-called black varnish, which is mostly composed of asphalt or tar.

Cleaning Inferior Gold Articles.—The brown film which forms on low-quality gold articles is removed by coating with fuming hydrochloric acid, whereupon they are brushed off with Vienna lime and petroleum. Finally, clean the objects with benzine, rinse again in pure benzine, and dry in sawdust.

To Clean Bronze.—Clean the bronze with soft soap; next wash it in plenty of water; wipe, let dry, and apply light encaustic mixture composed of spirit of turpentine in which a small quantity of yellow wax has been dissolved. The encaustic is spread by means of a linen or woollen wad. For gilt bronze, add 1 spoonful of alkali to 3 spoonfuls of water and rub the article with this by means of a ball of wadding. Next wipe with a clean chamois, similar to that employed in silvering.

How to Clean Brass and Steel.—To clean brasses quickly and economically, rub them with vinegar and salt or with oxalic acid. Wash immediately after the rubbing, and polish with tripoli and sweet oil. Unless the acid is washed off the article will tarnish quickly. Copper kettles and saucepans, brass andirons, fenders, and candlesticks and trays are best cleaned with vinegar and salt. Cooking vessels in constant use need only to be well washed afterwards. Things for show—even pots and pans—need the oil polishing, which gives a deep, rich, yellow luster, good for six months. Oxalic acid and salt should be employed for furniture brasses—if it touches the wood it only improves the tone. Wipe the brasses well with a wet cloth, and polish thoroughly with oil and tripoli. Sometimes powdered rotten stone does better than the tripoli. Rub, after using, either with a dry cloth or leather, until there is no trace of oil. The brass to be cleaned must be freed completely from grease, caked dirt, and grime. Wash with strong ammonia suds and rinse dry before beginning with the acid and salt.

The best treatment for wrought steel is to wash it very clean with a stiff brush

and ammonia soapsuds, rinse well, dry by heat, oil plentifully with sweet oil, and dust thickly with powdered quicklime. Let the lime stay on 2 days, then brush it off with a clean, very stiff brush. Polish with a softer brush, and rub with cloths until the luster comes out. By leaving the lime on, iron and steel may be kept from rust almost indefinitely.

Before wetting any sort of bric-a-brac, and especially bronzes, remove all the dust possible. After dusting, wash well in strong white soapsuds and ammonia, rinse clean, polish with just a suspicion of oil and rotten stone, and rub off afterwards every trace of the oil. Never let acid touch a bronze surface, unless to eat and pit it for antique effects.

Composition for Cleaning Copper, Nickel, and other Metals.—Wool grease, 46 parts, by weight; fire clay, 30 parts, by weight; paraffine, 5 parts, by weight; Canova wax, 5 parts, by weight; coconut oil, 10 parts, by weight; oil of mirbane, 1 part, by weight. After mixing these different ingredients, which constitute a paste, this is molded in order to give a cylindrical form, and introduced into a case so that it can be used like a stick of cosmetic.

Putz Pomade.—I.—Oxalic acid, 1 part; caput mortuum, 15 parts (or, if white pomade is desired, tripoli, 12 parts); powdered pumice stone, best grade, 20 parts; palm oil, 60 parts; petroleum or oleine, 4 parts. Perfume with mirbane oil.

II.—Oxalic acid..... 1 part
Peroxide of iron
(Jewelers' rouge).. 15 parts
Rotten stone..... 20 parts
Palm oil..... 60 parts
Petrolatum..... 5 parts

Pulverize the acid and the rotten stone and mix thoroughly with the rouge. Sift to remove all grit, then make into a paste with the oil and petrolatum. A little nitro-benzol may be added to scent the mixture.

III.—Oleine..... 40 parts
Ceresine..... 5 parts
Tripoli..... 40 parts
Light mineral oil
(0.870)..... 20 parts

Melt the oleine, ceresine, and mineral oil together, and stir in the tripoli; next, grind evenly in a paint mill.

To Clean Gummed Parts of Machinery.—Boil about 10 to 15 parts of caustic soda or 100 parts of soda in 1,000 parts of water, immerse the parts to be

cleaned in this for some time, or, better, boil them with it. Then rinse and dry. For small shops this mode of cleaning is doubtless the best.

To Remove Silver Plating.—I.—Put sulphuric acid 100 parts and potassium nitrate (saltpeter) 10 parts in a vessel of stoneware or porcelain, heated on the water bath. When the silver has left the copper, rinse the objects several times. This silver stripping bath may be used several times, if it is kept in a well-closed bottle. When it is saturated with silver, decant the liquid, boil it to dryness, then add the residue to the deposit, and melt in the crucible to obtain the metal.

II.—Stripping silvered articles of the silvering may be accomplished by the following mixture: Sulphuric acid, 60° B., 3 parts; nitric acid, 40° B., 1 part; heat the mixture to about 166° F., and immerse the articles by means of a copper wire. In a few seconds the acid mixture will have done the work. A thorough rinsing off is, of course, necessary.

To Clean Zinc Articles.—In order to clean articles of zinc, stir rye bran into a paste with boiling water, and add a handful of silver sand and a little vitriol. Rub the article with this paste, rinse with water, dry, and polish with a cloth.

To Remove Rust from Nickel.—Smear the rusted parts well with grease (ordinary animal fat will do), and allow the article to stand several days. If the rust is not thick the grease and rust may be rubbed off with a cloth dipped in ammonia. If the rust is very deep, apply a diluted solution of hydrochloric acid, taking care that the acid does not touch the metal, and the rust may be easily rubbed off. Then wash the article and polish in the usual way.

Compound for Cleaning Brass.—To make a brass cleaning compound use oxalic acid, 1 ounce; rotten stone, 6 ounces; enough whale oil and spirits of turpentine of equal parts, to mix, and make a paste.

To Clean Gilt Objects.—I.—Into an ordinary drinking glass pour about 20 drops of ammonia, immerse the piece to be cleaned repeatedly in this, and brush with a soft brush. Treat the article with pure water, then with alcohol, and wipe with a soft rag.

II.—Boil common alum in soft, pure water, and immerse the article in the solution, or rub the spot with it, and dry with sawdust.

III.—For cleaning picture frames,

moldings, and, in fact, all kinds of gilded work, the best medium is liquor potassæ, diluted with about 5 volumes of water. Dilute alcohol is also excellent. Methylated wood spirit, if the odor is not objectionable, answers admirably.

To Scale Cast Iron.—To remove the scale from cast iron use a solution of 1 part vitriol and 2 parts water; after mixing, apply to the scale with a cloth rolled in the form of a brush, using enough to wet the surface well. After 8 or 10 hours wash off with water, when the hard, scaly surface will be completely removed.

Cleaning Funnels and Measures.—Funnels and measures used for measuring varnishes, oils, etc., may be cleaned by soaking them in a strong solution of lye or pearlash. Another mixture for the same purpose consists of pearlash with quicklime in aqueous solution. The measures are allowed to soak in the solution for a short time, when the resinous matter of the paint or varnish is easily removed. A thin coating of petroleum lubricating oils may be removed, it is said, by the use of naphtha or petroleum benzine.

To Clean Aluminum.—I.—Aluminum articles are very hard to clean so they will have a bright, new appearance. This is especially the case with the matted or frosted pieces. To restore the pieces to brilliancy place them for some time in water that has been slightly acidulated with sulphuric acid.

II.—Wash the aluminum with coal-oil, gasoline or benzine, then put it in a concentrated solution of caustic potash, and after washing it with plenty of water, dip it in the bath composed of $\frac{2}{3}$ nitric acid and $\frac{1}{3}$ water. Next, subject it to a bath of concentrated nitric acid, and finally to a mixture of rum and olive oil. To render aluminum capable of being worked like pure copper, $\frac{2}{3}$ of oil of turpentine and $\frac{1}{3}$ stearic acid are used. For polishing by hand, take a solution of 30 parts of borax and 1,000 parts of water, to which a few drops of spirits of ammonia have been added.

How to Clean Tarnished Silver.—I.—If the articles are only slightly tarnished, mix 3 parts of best washed and purified chalk and 1 part of white soap, adding water, till a thin paste is formed, which should be rubbed on the silver with a dry brush, till the articles are quite bright. As a substitute, whiting, mixed with caustic ammonia to form a paste, may be used. This mixture is very effective, but it irritates the eyes and nose.

II.—Place the silver articles in an aluminum pan in which has been placed a water solution of about 2 per cent washing soda. Allow to remain in this solution until clean then remove and rinse. An aluminum pan is essential.

III.—A solution of crystallized potassium permanganate has been recommended.

IV.—A grayish violet film which silverware acquires from perspiration, can be readily removed by means of ammonia.

V.—To remove spots from silver lay it for 4 hours in soapmakers' lye, then throw on fine powdered gypsum, moisten the latter with vinegar to cause it to adhere, dry near the fire, and wipe off. Next rub the spot with dry bran. This not only causes it to disappear, but gives extraordinary gloss to the silver.

VI.—Cleaning with the usual fine powders is attended with some difficulty and inconvenience. An excellent result is obtained without injury to the silver by employing a saturated solution of hyposulphite of soda, which is put on with a brush or rag. The article is then washed with plenty of water.

VII.—Never use soap on silverware, as it dulls the luster, giving the article more the appearance of pewter than silver. When it wants cleaning, rub it with a piece of soft leather and prepared chalk, made into a paste with pure water, entirely free from grit.

To Clean Dull Gold.—I.—Take 80 parts, by weight, of chloride of lime, and rub it up with gradual addition of water in a porcelain mortar into a thin, even paste, which is put into a solution of 80 parts, by weight, of bicarbonate of soda, and 20 parts, by weight, of salt, in 3,000 parts, by weight, of water. Shake it, and let stand a few days before using. If the preparation is to be kept for any length of time the bottle should be placed, well corked, in the cellar. For use, lay the tarnished articles in a dish, pour the liquid, which has previously been well shaken, over them so as just to cover them, and leave them therein for a few days.

II.—Bicarbonate of soda. 31 parts
Chloride of lime. 15.5 parts
Cooking salt. 15 parts
Water. 240 parts

Grind the chloride of lime with a little water to a thin paste, in a porcelain vessel, and add the remaining chemicals. Wash the objects with the aid of a soft brush with the solution, rinse several times in water, and dry in fine sawdust.

Cleaning Bronze Objects.—Employ powdered chicory mixed with water, so as to obtain a paste, which is applied with a brush. After the brushing, rinse off and dry in the sun or near a stove.

Cleaning Gilded Bronzes.—I.—Commence by removing the spots of grease and wax with a little potash or soda dissolved in water. Let dry, and apply the following mixture with a rag: Carbonate of soda, 7 parts; whiting, 15 parts; alcohol (85°), 50 parts; water, 125 parts. When this coating is dry pass a fine linen cloth or a piece of supple skin over it. The hollow parts are cleaned with a brush.

II.—After removing the grease spots, let dry and pass over all the damaged parts a pencil dipped in the following mixture: Alum, 2 parts; nitric acid, 65; water, 250 parts. When the gilding becomes bright, wipe, and dry in the sun or near a fire.

III.—Wash in hot water containing a little soda, dry, and pass over the gilding a pencil soaked in a liquid made of 30 parts nitric acid, 4 parts of aluminum phosphate, and 125 parts of pure water. Dry in sawdust.

IV.—Immerse the objects in boiling soap water, and facilitate the action of the soap by rubbing with a soft brush; put the objects in hot water, brush them carefully, and let them dry in the air; when they are quite dry rub the shining parts only with an old linen cloth or a soft leather, without touching the others.

Stripping Gilt Articles.—Degilding or stripping gilt articles may be done by attaching the object to the positive pole of a battery and immersing it in a solution composed of 1 pound of cyanide dissolved in about 1 gallon of water. Desilvering may be effected in the same manner.

To Clean Tarnished Zinc.—Apply with a rag a mixture of 1 part sulphuric acid with 12 parts of water. Rinse the zinc with clear water.

Cleaning Pewter Articles.—Pour hot lye of wood ashes upon the tin, throw on sand, and rub with a hard, woolen rag, hat felt, or whisk until all particles of dirt have been dissolved. To polish pewter plates it is well to have the turner make similar wooden forms fitting the plates, and to rub them clean this way. Next they are rinsed with clean water and placed on a table with a clean linen cover on which they are left to dry without being touched, otherwise spots will appear. This scouring is not necessary so often if the pewter is rubbed with wheat

bran after use and cleaned perfectly. New pewter is polished with a paste of whiting and brandy, rubbing the dishes with it until the mass becomes dry.

To Clean Files.—Files which have become clogged with tin or lead are cleaned by dipping for a few seconds into concentrated nitric acid. To remove iron filings from the file cuts, a bath of blue vitriol is employed. After the files have been rinsed in water they are likewise dipped in nitric acid. File-ridges closed up by zinc are cleaned by immersing the files in diluted sulphuric acid. Such as have become filled with copper or brass are also treated with nitric acid, but here the process has to be repeated several times. The files should always be rinsed in water after the treatment, brushed with a stiff brush, and dried in sawdust or by pouring alcohol over them, and letting it burn off on the file.

Scale Pan Cleaner.—About the quickest cleaner for brass scale pans is a solution of potassium bichromate in dilute sulphuric acid, using about 1 part of chromate, in powder, to 3 parts of acid and 6 parts of water. In this imbibe a cloth wrapped around a stick (to protect the hands), and with it rub the pans. Do this at tap or hydrant, so that no time is lost in placing the pan in running water after having rubbed it with the acid solution. For pans not very badly soiled rubbing with ammonia water and rinsing is sufficient.

Tarnish on Electro-Plate Goods.—This tarnish can be removed by dipping the article for from 1 to 15 minutes—that is, until the tarnish shall have been removed—in a pickle of the following composition: Rain water 2 gallons and potassium cyanide $\frac{1}{2}$ pound. Dissolve together, and fill into a stone jug or jar, and close tightly. The article, after having been immersed, must be taken out and thoroughly rinsed in several waters, then dried with fine, clean sawdust. Tarnish on jewelry can be speedily removed by this process; but if the cyanide is not completely removed it will corrode the goods.

OIL-, GREASE-, PAINT-SPOT ERADICATORS:

Grease- and Paint-Spot Eradicators.
I.—Benzol..... 500 parts
Benzine..... 500 parts
Soap, best white,
shaved..... 5 parts
Water, warm, sufficient.

Dissolve the soap in the warm water, using from 50 to 60 parts. Mix the benzol and benzine, and add the soap solution, a little at a time, shaking up well after each addition. If the mixture is slow in emulsifying, add at one time from 50 to 100 parts of warm water, and shake violently. Set the emulsion aside for a few days, or until it separates, then decant the superfluous water, and pour the residual pasty mass, after stirring it up well, into suitable boxes.

II.—Soap spirit..... 100 parts
Ammonia solution,
10 per cent..... 25 parts
Acetic ether..... 15 parts

III.—Extract of quillaia . 1 part
Borax..... 1 part
Ox gall, fresh..... 6 parts
Tallow soap..... 15 parts

Triturate the quillaia and borax together, incorporate the ox gall, and, finally, add the tallow soap and mix thoroughly by kneading. The product is a plastic mass, which may be rolled into sticks or put up into boxes.

Removing Oil Spots from Leather.—To remove oil stains from leather, dab the spot carefully with spirits of sal ammoniac, and after allowing it to act for a while, wash with clean water. This treatment may have to be repeated a few times, taking care, however, not to injure the color of the leather. Sometimes the spot may be removed very simply by spreading the place rather thickly with butter and letting this act for a few hours. Next scrape off the butter with the point of a knife, and rinse the stain with soap and lukewarm water.

To Clean Linoleum.—Rust spots and other stains can be removed from linoleum by rubbing with steel chips.

To Remove Putty, Grease, etc., from Plate Glass.—To remove all kinds of greasy materials from glass, and to leave the latter bright and clean, use a paste made of benzine and burnt magnesia of such consistence that when the mass is pressed between the fingers a drop of benzine will exude. With this mixture and a wad of cotton, go over the entire surface of the glass, rubbing it well. One rubbing is usually sufficient. After drying, any of the substance left in the corners, etc., is easily removed by brushing with a suitable brush. The same preparation is very useful for cleaning mirrors and removing grease stains from books, papers, etc.

Removing Spots from Furniture.—White spots on polished tables are removed in the following manner: Coat the spot with oil and pour on a rag a few drops of "mixture balsamica oleosa," (another name for Pine Oil) and rub on the spot, which will disappear immediately.

To Remove Spots from Drawings, etc.—Place soapstone, fine meerschaum shavings, amianthus, or powdered magnesia on the spot, and, if necessary, lay on white filtering paper, saturating it with peroxide of hydrogen. Allow this to act for a few hours, and remove the application with a brush. If necessary, repeat the operation. In this manner black coffee spots were removed from a valuable diagram without erasure by knife or rubber.

WATCHMAKERS' AND JEWELERS' CLEANING PREPARATIONS:

To Clean the Tops of Clocks in Repairing.—Sprinkle whiting on the top. Pour good vinegar over this and rub vigorously. Rinse in clean water and dry slowly in the sun or at the fire. A good polish will be obtained.

To Clean Watch Chains.—Gold or silver watch chains can be cleaned with a very excellent result, no matter whether they be matt or polished, by laying them for a few seconds in pure aqua ammonia; they are then rinsed in alcohol, and finally shaken in clean sawdust, free from sand. Imitation gold and plated chains are first cleaned in benzine, then rinsed in alcohol, and afterwards shaken in dry sawdust. Ordinary chains are first dipped in the following pickle: Pure nitric acid is mixed with concentrated sulphuric acid in the proportion of 10 parts of the former to 2 parts of the latter; a little table salt is added. The chains are boiled in this mixture, then rinsed several times in water, afterwards in alcohol, and finally dried in sawdust.

Cleaning Brass Mountings on Clock Cases, etc.—The brass mountings are first cleaned of dirt by dipping them for a short time into boiling soda lye, and next are pickled, still warm, if possible, in a mixture consisting of nitric acid, 60 parts; sulphuric acid, 40 parts; cooking salt, 1 part; and shining soot (lamp-black), $\frac{1}{2}$ part, whereby they acquire a handsome golden-yellow coloring. The pickling mixture, however, must not be employed immediately after pouring together the acids, which causes a strong generation of heat, but should settle for at least

This makes the articles handsomer and more uniform. After the dipping the objects are rinsed in plenty of clean water and dried on a hot, iron plate, and at the same time warmed for lacquering. Since the pieces would be lacquered too thick and unevenly in pure gold varnish, this is diluted with alcohol, 1 part of gold varnish sufficing for 10 parts of alcohol. Into this liquid dip the mountings previously warmed and dry them again on the hot plate.

Gilt Zinc Clocks.—It frequently happens that clocks of gilt zinc become covered with green spots. To remove such spots the following process is used: Soak a small wad of cotton in alkali and rub it on the spot. The green color will disappear at once, but the gilding being gone, a black spot will remain. Wipe off well to remove all traces of the alkali. To replace the gilding, put on, by means of liquid gum arabic, a little bronze powder of the color of the gilding. The powdered bronze is applied dry with the aid of a brush or cotton wad. When the gilding of the clock has become black or dull from age, it may be revived by immersion in a bath of cyanide of potassium, but frequently it suffices to wash it with a soft brush in soap and water, in which a little carbonate of soda has been dissolved. Brush the piece in the lather, rinse in clean water, and dry in rather hot sawdust. The piece should be dried well inside and outside, as moisture will cause it to turn black.

To Clean Gummed Up Springs.—Dissolve caustic soda in warm water, place the spring in the solution and leave it there for about one half hour. Any oil still adhering may now easily be taken off with a hard brush; next, dry the spring with a clean cloth. In this manner gummed up parts of tower clocks, locks, etc., may be quickly and thoroughly cleaned, and oil paint may be removed from metal or wood. The lye is sharp, but free from danger, nor are the steel parts attacked by it.

To Clean Soldered Watch Cases.—Gold, silver, and other metallic watch cases which in soldering have been exposed to heat, are laid in diluted sulphuric acid (1 part acid to 10 to 15 parts water), to free them from oxide. Heating the acid accelerates the cleaning process. The articles are then well rinsed in water and dried. Gold cases are next brushed with powdered tripoli moistened with oil, to remove the pale spots caused by the heat and boiling, and to restore

the original color. After that they are cleaned with soap water and finally polished with rouge. Silver cases are polished after boiling, with a scratch brush dipped in beer.

A Simple Way to Clean a Clock.—Take a bit of cotton the size of a hen's egg; dip it in kerosene and place it on the floor of the clock, in the corner; shut the door of the clock, and wait 3 or 4 days. The clock will be like a new one—and if you look inside you will find the cotton batting black with dust. The fumes of the oil loosen the particles of dust, and they fall, thus cleaning the clock.

To Restore the Color of a Gold or Gilt Dial.—Dip the dial for a few seconds in the following mixture: Half an ounce of cyanide of potassium is dissolved in a quart of hot water, and 2 ounces of strong ammonia, mixed with $\frac{1}{2}$ an ounce of alcohol, are added to the solution. On removal from this bath, the dial should immediately be immersed in warm water, then brushed with soap, rinsed, and dried in hot boxwood dust. Or it may simply be immersed in dilute nitric acid; but in this case any painted figures will be destroyed.

A Bath for Cleaning Clocks.—In an enameled iron or terra-cotta vessel pour 2,000 parts of water, add 50 parts of scraped Marseilles soap, 80 to 100 parts of whiting, and a small cup of spirits of ammonia. To hasten the process of solution, warm, but do not allow to boil.

If the clock is very dirty or much oxidized, immerse the pieces in the bath while warm, and as long as necessary. Take them out with a skimmer or strainer, and pour over them some benzine, letting the liquid fall into an empty vessel. This being decanted and bottled can be used indefinitely for rinsing.

If the bath has too much alkali or is used when too hot, it may affect the polish and render it dull. This may be obviated by trying different strengths of the alkali. Pieces of blued steel are not injured by the alkali, even when pure.

To Remove a Figure or Name from a Dial.—Oil of spike lavender may be employed for erasing a letter or number. Enamel powder made into a paste with water, oil, or turpentine is also used for this purpose. It should be previously levigated so as to obtain several degrees of fineness. The powder used for repolishing the surface, where an impression has been removed, must be extremely fine. It is applied with a piece of peg-